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SUPERSEDING
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(See 6.9)

MILITARY SPECIFICATION

EXTINGUISHER, FIRE, BROMOTRIFLUOROMETHANE (HALON 1301) SYSTEMS (FIXED PIPE, PNEUMATICALLY ACTUATED, NAVAL SHIPBOARD USE)

This specification is approved for use within the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers chemical (Halon 1301) fire extinguisher system components, including local and remote actuation devices of the fixed (stationary) type whereby Halon 1301 (liquified and pressurized with nitrogen to 600 pounds per square inch (lb/in²) at 70 degrees Fahrenheit (°F) (21 degrees Celsius (°C)) and stowed in containers) is expelled by remote control through a fixed piping system and with discharge nozzles to a predetermined space, compartment, or area.

1.2 Classification. Halon 1301 fire extinguisher systems shall be of the following classes, as specified (see 6.2.1):

- Class I - Systems in which magnetic materials are permitted.
- Class II - Systems in which all materials are nonmagnetic.

1.2.1 Halon cylinders shall be of the following sizes, as specified (see 6.2.1):

- Size 1 - 10-pound capacity Halon 1301 cylinders
- Size 2 - 15-pound capacity Halon 1301 cylinders
- Size 3 - 60-pound capacity Halon 1301 cylinders
- Size 4 - 95-pound capacity Halon 1301 cylinders
- Size 5 - 125-pound capacity Halon 1301 cylinders
(Size 5 available in class I only)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4210

DISTRIBUTION STATEMENT A Approved for public release; distribution unlimited

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

- BB-C-101 - Carbon Dioxide (CO₂): Technical and U.S.P.
- BB-N-411 - Nitrogen, Technical.
- QQ-B-626 - Brass, Leaded and Nonleaded: Rod, Shapes, Forgings, and Flat Products with Finished Edges (Bar and Strip).
- QQ-B-637 - Brass, Naval: Rod, Shapes, Forgings, and Flat Products with Finished Edges (Bar and Strip).
- QQ-S-763 - Steel Bars, Wire, Shapes, and Forgings, Corrosion-Resisting.
- RR-C-901 - Cylinders, Compressed Gas: High Pressure, Steel Dot 3AA, and Aluminum Applications, General Specification for.
- TT-P-1757 - Primer Coating, Zinc Chromate, Low-Moisture-Sensitivity.
- PPP-B-636 - Boxes, Shipping, Fiberboard.

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- MIL-P-116 - Preservation, Methods of.
- MIL-T-704 - Treatment and Painting of Materiel.
- MIL-S-901 - Shock Tests, H.I. (High-Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
- MIL-E-2036 - Enclosures for Electric and Electronic Equipment, Naval Shipboard.
- MIL-M-12218 - Monobromotrifluoromethane (Liquified), Technical Grade for Fire Extinguisher.
- MIL-C-16310 - Cylinder Compressed Gas (Compressed Air and Carbon Dioxide, Nonshatterable and Non-magnetic).
- MIL-I-17214 - Indicator, Permeability; Low-Mu (Go-No Go).
- MIL-V-17360 - Valve, Cylinder, Gas, Carbon Dioxide Fire Extinguisher.
- MIL-E-17555 - Electronic and Electrical Equipment, Accessories, and Provisioned Items (Repair Parts): Packaging of.
- MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated.
- MIL-S-22473 - Sealing, Locking, and Retaining Compounds: (Single-Component).

STANDARDS

FEDERAL

- FED-STD-H28 - Screw-Thread Standards for Federal Services.
- FED-STD-151 - Metals; Test Methods.

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- MIL-STD-101 - Color Code for Pipelines and for Compressed Gas Cylinders.
- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-130 - Identification Marking of US Military Property.
- MIL-STD-167-1 - Mechanical Vibrations of Shipboard Equipment (Type I - Environmental and Type II - Internally Excited).
- MIL-STD-278 - Fabrication Welding and Inspection; and Casting Inspection and Repair for Machinery, Piping and Pressure Vessels in Ships of the United States Navy.
- MIL-STD-794 - Parts and Equipment, Procedures for Packaging of.
- MIL-STD-810 - Environmental Test Methods and Engineering Guidelines.
- MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking and Waterproofing, with Appropriate Test Methods.
- MS16142 - Boss, Gasket Seal Straight Thread Tube Fitting, Standard Dimensions for.
- MS18229 - Plug for "O" Ring Gasket.
- MS33656 - Fitting End, Standard Dimensions for Flared Tube Connection and Gasket Seal.
- MS51531 - Nut, Tube Coupling, 37° Flared.
- MS51532 - Cap, Tube, 37° Flared.
- MS51533 - Sleeve, Compression, Tube Fitting, 37° Flared.

2.1.2 Other Government drawing and publications. The following other Government drawing and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

DRAWING

NAVAL SEA SYSTEMS COMMAND (NAVSEA)
810-1385782 - Hangers, Pipe for Submarines.

PUBLICATIONS

DEPARTMENT OF TRANSPORTATION (DOT)
Code of Federal Regulations (CFR), CFR 49, Parts
100-199 Hazardous Material Regulations.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

NATIONAL BUREAU OF STANDARDS (NBS)

Handbook H44 - Specifications, Tolerances, and Other Technical Requirements for Commercial Weighing and Measuring Devices.

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, DC 20402.)

(Copies of specifications, standards, drawings, and publications required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

B16.11 - Forged Steel Fittings, Socket-Welding and Threaded.
(DoD adopted)

B40.1 - Gauges - Pressure Indicating Dial Type - Elastic Element. (DoD adopted)

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 276 - Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes. (DoD adopted)

A 403 - Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings. (DoD adopted)

A 479 - Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels. (DoD adopted)

D 3951 - Standard Practice for Commercial Packaging. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT

National Motor Freight Classification

(Application for copies should be addressed to the National Motor Freight Traffic Association, Inc., ATA TRAFFIC Dept., 2200 Mill Road, Alexandria, VA 22314.)

STEEL STRUCTURES PAINTING COUNCIL (SSPC)

SP-10 - Near White Blast Cleaning.

(Application for copies should be addressed to the Steel Structures Painting Council, 4400 Fifth Avenue, Pittsburgh, PA 15213.)

UNIFORM CLASSIFICATION COMMITTEE AGENT

Uniform Freight Classification Ratings, Rules and Regulations.

(Application for copies should be addressed to the Uniform Classification Committee Agent, Tariff Publication Officer, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Class I fire extinguisher systems furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time set for opening of bids (see 4.3 and 6.3).

3.1.1 First article. When specified in the contract or purchase order, two samples of class II fire extinguisher systems shall be subjected to first article inspection (see 4.3.2 and 6.4).

3.2 Construction. The fire extinguishing system shall consist of cylinders, cylinder valves, pneumatic actuation devices, vent fittings, flexible discharge hoses, flexible actuation hoses, check valves, time delay devices, time delay bypass valves, pressure switches, discharge nozzles, cylinder clamps and saddles, and scales, as specified herein (see 3.2.16). Equipment shall operate in accordance with the requirements of this specification in the range of ambient temperatures from 50 to 200°F (10 to 93°C), except carbon dioxide (CO₂) actuator cylinder and valve assemblies which shall operate from 50 to 150°F (10 to 65.5°C). Charged Halon cylinders shall withstand extended storage at ambient temperatures between 0°F and plus 120°F (minus 18°C and plus 49°C). Unless otherwise specified herein, threads shall be in accordance with FED-STD-H28. Class 2 threads are acceptable in lieu of class 3 threads required by specifications referenced herein. Unless otherwise specified herein, corrosion resisting steel (CRES) specified herein shall be class WP304 or WP304L, or class WP316 or WP316L, in accordance with ASTM A 403 and ANSI B16.11 for welded fittings or type 304, 304L, 316 or 316L in accordance with ASTM A 276 or ASTM A 479 for bar stock forms or shapes.

3.2.1 Halon cylinders, class I, sizes 1, 2, 3, 4, and 5. Class I Halon 1301 cylinders shall be nonshatterable steel in accordance with RR-C-901, except as specified herein. The neck of the cylinders shall have internal threads 2-1/2-12UN-2B with provision for an O-ring seal in accordance with MS16142. The neck of the cylinders shall have 6-1/2-8UN-1A external threads for a cylinder valve protective cap. The minimum internal height of the cap shall be 10 inches from the cylinder neck facing. Cylinder dimensions, weights and service pressure shall be as specified in table I. A closed top anti-recoil side vented protective cap shall be furnished with each cylinder. Side vents shall be closed to the weather by means of tape or plugs which will blow out if Halon is released.

TABLE I. Class I cylinder dimensions, weight, and service pressure.

Size	Outside diameter (inches)	Height (inches)	Halon 1301 capacity (pounds)	Minimum volume (in ³)	Approximate weight (empty) (pounds)	Service pressure (lb/in ²)
1	8.50 ± 0.187	17 ± 1	10	500	40	2015
2	8.50 ± .187	17 ± 1	15	500	40	2015
3	8.50 ± .187	35 ± 1	60	1480	75	2015
4	8.50 ± .187	51 ± 1	95	2350	110	2015
5	9.25 ± .187	56 ± 1	125	3090	150	2015

3.2.2 Halon cylinders, class II, sizes 1, 2, 3, and 4. Class II Halon 1301 cylinders shall be in accordance with MIL-C-16310, except as modified herein. Cylinder necks shall be modified as specified in 3.2.1. Cylinder valve protective caps as specified in 3.2.1 shall be furnished. Cylinder dimensions, weight, and service pressure shall be as specified in table II.

TABLE II. Class II cylinder dimensions, weight, and service pressure.

Size	Outside diameter (inches)	Height (inches)	Halon 1301 capacity (pounds)	Minimum volume (in ³)	Approximate weight (empty) (pounds)	Service pressure (lb/in ²)
1	8.50 ± 0.187	17 ± 1	10	500	45	2015
2	8.50 ± .187	17 ± 1	15	500	45	2015
3	8.50 ± .187	35 ± 1	60	1480	100	2015
4	8.50 ± .187	54 ± 1	95	2350	142	2015

3.2.3 Halon cylinder valves. Material for the Halon cylinder valve body shall be CRES or brass. If CRES material is used, it shall be in accordance with QQ-S-763, except that types 202, 302, or 303 shall not be acceptable. If brass material is used, alloy number 377 of QQ-B-626 or alloy number 482 of QQ-B-637 shall be used for forged parts, and alloy number 360 of QQ-B-626 or alloy number 482 of QQ-B-637 shall be used for non-forged parts. Parts within the cylinder valve shall be of a material suitable for the purpose intended, and shall meet the valve operational requirements as well as environmental requirements specified herein. The internal parts of the cylinder valve need not conform to the same material specification as the valve body. Valve inlets shall have male threads 2-1/2-12UN-2A with provisions for a static O-ring seal

in accordance with MS18229. Maximum valve height, including valve actuator (see 3.2.3.2) shall be 9-1/2 inches above the cylinder neck facing. A safety vent relief hole, 0.062 inch in diameter shall be placed in the first full thread below the O-ring. Where a detachable valve actuator is used, the cylinder valve actuator port shall be provided with a threaded vented cap attached by a length of chain. The port and cap shall be located on the valve top on the vertical axis of the valve assembly. Cylinder valves shall be such that the valves will not open when pressure equal to that within the cylinder is exerted on the valve spool through the valve outlet. Cylinder valves and actuation devices for all cylinder sizes shall be functionally and dimensionally identical. Cutter-disc type or squib (detonator) actuated valves will not be acceptable. The threads between the Halon cylinder and Halon cylinder valve shall be restrained from movement by application of a grade B sealing compound in accordance with MIL-S-22473, or an anaerobic sealant with equal locking torque. The cylinder valve shall be torqued to the cylinder at a minimum of 80 foot-pounds, and shall withstand the breaking torque test specified in 4.6.7.2. The connection shall withstand the test specified in 4.6.7.1.

3.2.3.1 Valve outlet. The valve outlet shall be horizontal and located on the side of the valve with the centerline located $2\text{-}1/4 \pm 1$ inch above the cylinder neck facing. Outlets shall have male threads 1-7/8-12UN-3A in accordance with MS33656. An anti-recoil cap shall be installed on the valve outlet. The anti-recoil cap shall be attached to the valve by a length of chain and shall have a CRES, brass or durable plastic warning label which shall be permanently attached to the chain or cap. The durable plastic material shall not be structurally weakened by temperatures less than 140°F (60°C). The warning label shall have red letters on a white background, stating: "This cap must be in place while cylinder is in transit or in stowage and at any time discharge hose is detached".

3.2.3.2 Valve actuator. The cylinder valve shall include a pneumatic actuator positioned on the valve top on the vertical axis of the valve assembly. The actuator inlet shall be vertical. The inlet connection shall be male 7/16-20UNF-3A threads in accordance with MS33656. The actuator inlet connection shall be provided with a threaded, vented cap with 7/16-20UNF-2B threads in accordance with MS51532 attached to the actuator by a short length of chain. When supplied with CO₂ from the pneumatic actuation device specified in 3.2.4 at 50°F (10°C), the valve actuator shall open the cylinder valves on the cylinders pressurized to 3000 lb/in² when tested as specified in 4.6.16. The CO₂ pressure required to open the Halon valves in the system actuation test (see 4.6.16) shall not exceed 600 lb/in². The materials for class I and II actuators shall be brass or CRES, similar to the Halon cylinder valve body. Valve actuators for all cylinder sizes shall be functionally and dimensionally identical (see 6.2.1).

3.2.3.3 Siphon tube. The cylinder valve inlet shall be drilled, tapped and fitted with a metallic, other than aluminum, siphon tube. The tube shall extend to within approximately 1-1/2 inches of the cylinder bottom when the valve is installed in the cylinder.

3.2.3.4 Safety release device. The cylinder valve shall be fitted with a safety disc assembly dimensionally and functionally equal to that specified in MIL-V-17360, except that the visual indicator shall not be provided. The safety release device shall be located on the side of the valve with the centerline located $1 \pm 1/4$ inch above the cylinder neck and facing 90 ± 5 degrees to the left when viewed from the cylinder valve outlet.

3.2.3.5 Pressure gauge. The cylinder valve shall have a 1-1/2 inch minimum diameter, back connected, Bourdon Tube type pressure gauge with a range of 0-1500 lb/in² as specified (see 6.2.1). The graduated scale shall be 270 degrees. The gauge shall be in accordance with ANSI B40.1, grade B. The gauge shall have the capability to be pressurized to at least 3000 lb/in² without rupture. Gauge cases shall be vented and closed with an elastomeric grommet or equipped with a blow-out section. The gauge shall be located on a side of the valve with the centerline $1 \pm 1/4$ inch above the cylinder neck face and 90 ± 5 degrees to the right when viewed from the cylinder valve outlet. The gauge shall be installed so that the 600 lb/in² marking is oriented vertically upwards. If the gauge is attached to the valve by taper pipe threads, the threads shall be sealed by Teflon tape or equivalent.

3.2.3.6 Cylinder valve and siphon tube flow rate. The cylinder valve and siphon tube assembly shall have an equivalent length of not greater than 20 feet of 1-1/4 inch schedule 80 steel pipe when tested as specified in 4.6.5.

3.2.4 Pneumatic actuation devices. Systems shall be actuated pneumatically from separately located CO₂ cylinders equipped with safety pinned and seal wired quick-opening valves which shall deliver CO₂ to all Halon cylinder valve actuators by means of a time delay device (see 6.2.1). Each actuation device shall be furnished with a mounting bracket (see 3.2.4.3).

3.2.4.1 CO₂ cylinder. Class I CO₂ cylinders shall be nonshatterable steel in accordance with RR-C-901. Class II cylinders shall be in accordance with MIL-C-16310 modified as specified herein. The neck of the cylinders shall be tapped with 1/2-14NGT internal threads. All cylinders shall contain 80 ± 1 ounce of CO₂ at a fill density sufficiently low as to meet the high temperature requirement of 3.2.

3.2.4.2 Actuation cylinder valves. Valves shall be fitted with self-engaging lock-open devices and shall be manually operated by a lever requiring a maximum of 180 degrees movement. When specified (see 6.2.1), actuation cylinder valves shall be provided with electric solenoid operation in addition to the manually operated lever. The valve shall be equipped with a safety release device in accordance with MIL-V-17360 which releases the cylinder contents to atmosphere in the event of overpressurization. Connection to the cylinder shall be male 1/2-14NGT threads. The outlet connection shall be male 7/16-20UNF-3A threads in accordance with MS33656 and fitted with an anti-recoil cap attached to the valve by a length of chain. Materials shall be as specified in 3.2.3. Cutter-disc type or squib (detonator) actuated cylinder valves will not be acceptable. Valve operators shall be fitted with lead and wire seals. Actuating cylinder valve lock-open devices shall conform to the requirements specified herein following 1000 cycles of operation (see 4.6.6).

3.2.4.3 Mounting bracket. The bracket shall mount on a bulkhead and shall be other than a quick release type. The bracket shall consist of a saddle assembly, two saddle clamps, and bolts and nuts required for securing the saddle clamps to the saddle assembly. The saddle assembly shall have a clip to support the cylinder when the clamps are loosened.

3.2.5 Flexible discharge hoses and end connections. Flexible discharge hoses shall be CRES corrugated hose with at least two CRES heavy wire braid reinforcements, and shall have a minimum burst pressure of 5000 lb/in² (see 6.2.1). Nominal inside diameter (id) shall be 1-1/2 inches. The free length (exclusive of end connections) shall be $36 \pm 1/2$ inch. The minimum centerline bend radius shall not exceed 22 inches. End connections shall be CRES, except swivel nuts, which shall be CRES or brass similar to the Halon cylinder valve. One end shall be 1-1/2 inch nominal 37-degree flare female connection with swivel nut in accordance with MS51531 and sleeve in accordance with MS51533. The other end shall be 1-1/2 inch nominal 37-degree flare male connection in accordance with MS33656. Fabrication and inspection of welds shall be in accordance with class P-1 of MIL-STD-278 (see 4.6.4).

3.2.6 Flexible actuation hoses and end connections. Flexible hoses used in the pneumatic actuation system shall be nominal 1/4-inch id CRES corrugated hose with at least one CRES heavy wire braid reinforcement (see 6.2.1). The minimum burst pressure shall be at least 8000 lb/in² and the minimum centerline bend radius shall not exceed 4 inches. The free length (exclusive of end connections) shall be $10 \pm 1/2$ inch. End connections shall be CRES, 1/4-inch nominal 37-degree flare female with swivel nut in accordance with MS51531 and sleeve in accordance with MS51533. Fabrication and inspection of welds shall be in accordance with class P-1 of MIL-STD-278.

3.2.7 Check valves. Check valves shall be other than the swing check type (see 6.2.1). Check valve body, end connections, and other external parts shall be type 316 or 316L CRES. Internal components shall be of material suitable for its intended purpose. Pressure-temperature rating shall be 3000 lb/in² in accordance with ANSI B16.11, except that the maximum temperature shall be 200°F (93°C). The following markings shall be stamped on the check valve body: "INLET" and "OUTLET" near the applicable end, and an arrow designating the direction of flow. The check valves shall function normally when installed in any position.

3.2.7.1 Discharge check valves. Discharge check valves shall be 1-1/2 inch nominal pipe size (nps) with the inlet port having female 1-7/8-12UN-2B threads in accordance with MS51532. The outlet port shall be 1-1/2 inch nps female for socket welding, in accordance with ANSI B16.11. Non-metallic materials shall not be used in the discharge check valve. The pressure drop through check valves shall not exceed the equivalent length of 25 feet of 1-1/2 nps schedule 80 steel pipe (see 4.6.5).

3.2.7.2 Actuation manifold check valves. CO₂ actuation manifold check valves shall be 1/4-inch nps with union end connections (see 6.2.1). The tail pieces shall be in accordance with ANSI B16.11 and shall be carbon steel type 304L or 316L CRES as specified (see 6.2.1). The tail pieces of the unions shall be machined for 1/4-inch nps female socket welding. Union nuts shall be CRES. Actuation manifold check valves shall be of the soft-seated type. Porting shall be to a minimum of 75 percent of 1/4-inch schedule 80 steel pipe.

3.2.8 Vent fitting. The CO₂ actuating manifold vent fittings shall consist of CRES hexagon head 1/4NPT pipe plugs drilled through the long axis with a 1/16-inch diameter hole and counterbored on the exposed end to a 3/16-inch diameter and a depth of 5/16 ± 1/16 inch (see 6.2.1). A vent fitting shall be installed in the dead end of the actuating manifold.

3.2.9 Time delay devices. Pneumatic time delay devices shall be furnished to delay the opening of Halon cylinder valves and allow for shutdown of ventilation fans. The time delay shall be calibrated for either 30 seconds or 60 seconds with the nominal delay period as specified (see 6.2.1) to be set by the contractor and stamped on the time delay body. The actual time delay period shall not vary from the nominal setting by more than plus or minus 5 seconds when tested as specified in 4.6.3. Outlet connections of the time delay device shall be male 7/16-20UNF-3A threads in accordance with MS33656. Inlet connection to the time delay device shall be female 7/16-20UNF-2B threads in accordance with MS16142. Inlet and outlet flexible hose connections in accordance with 3.2.6 shall be furnished with each time delay device. "INLET" and "OUTLET" shall be stamped near the applicable connection point such that the markings can be read when the time delay is installed. Class I time delay device accumulator cylinders shall be made of carbon steel, CRES or brass. Class II time delay devices, and all parts other than accumulator cylinders in class I time delay devices, shall be made of CRES or brass. Internal components shall be of materials suitable for their intended purpose. Time delay devices shall be furnished with a mounting bracket as specified in 3.2.4.3. Time delay devices shall not be equipped with manual override features or provisions for the attachment or fitting thereof (see 4.6.1 and 4.6.8.1). The inlet of each time delay device shall be assembled with a filter as specified in 3.2.9.2.

3.2.9.1 Time delay bypass valve. The time delay bypass valve shall be 1/4-inch nps nonlubricated, two port, two position, 90-degree turn, ball type. Flow passage through the valve shall be not less than 75 percent of the area of 1/4-inch schedule 80 pipe. Inlet and outlet ports shall be in line. Pressure rating shall be 3000 lb/in². The end connections shall be unions with tail pieces machined for 1/4-inch nps female socket welding. The socket weld fitting dimensions shall be in accordance with ANSI B16.11. The tail pieces shall be carbon steel, or type 304L or 316L CRES as specified (see 6.2.1). Externals, body bolts, nuts, follower, adjusting nut, handle and handle nut shall be CRES 316L or 316. Internal components shall be of material suitable for its intended purpose. Operating torque with the valve pressurized to 1000 lb/in² shall not exceed 50 inch-pounds. Lever length of the valve handle shall not exceed 6 inches. Valve shall be open with lever in line with inlet-outlet connections and closed with the lever 90 degrees to inlet-outlet connections. Stops shall be provided at full open and full closed lever positions. A ring pin shall be provided with a chain attached to the exterior of the valve. The pin shall be inserted through the handle in such a way as to prevent opening the valve unless the pin is removed. A wire seal shall hold the ring pin in place. The valve shall meet the requirements of 4.6.2. A name plate shall be attached to the valve body. An arrow showing the direction to turn the operating lever, the word "OPEN" adjacent to the arrow, and the phrase "TIME DELAY OVERRIDE" shall be printed on the name plate.

3.2.9.2 Time delay filter. A straight-in-line bydirectional ultraporous filter shall be provided assembled with each time delay device (see 6.2.1). The filter shall be CRES and shall operate at a maximum pressure of not less than 3000 lb/in². The material shall be the same throughout the filter. The filter medium shall be a pleated wire cloth disc, with a nominal pore size of 10 micrometers and an absolute maximum pore size of 25 micrometers. The inlet connection to the filter shall be male 7/16-20UNF-2A threads in accordance with MS33656. The outlet, which connects the filter to the time delay device, shall be male 7/16-20UNF-2A threads with O-ring in accordance with MS18229. The length of the filter shall be less than 0.90 inch excluding the end connections. The area of the filter shall be not less than 1.5 square inches, and the pressure drop through the filter shall be not greater than 6.5 lb/in² with 900 lb/in² carbon dioxide flowing through the filter at a rate of 65 cubic feet per minute (ft³/min). An arrow showing the normal direction of flow shall be stamped on the body of the filter. The filter shall be cleanable by reversal of the normal direction of flow.

3.2.10 Pressure switches. Pressure switches shall be three-pole, single-throw for 600 volts alternating current (Vac), 20-ampere, 15-horsepower (hp), 3-phase and 120 Vac, 3-hp, 3-phase service (see 6.2.1). Pressure switches shall be provided with a means of manual operation for testing the electrical circuits without disconnecting piping. Flexible hose pressure connections as specified in 3.2.6 shall be furnished with each pressure switch. Electrical conduit connections shall be 3/4-14NPT female pipe threads. The enclosure shall be watertight and shall withstand the watertightness test of MIL-E-2036. Closed contacts may open momentarily but shall not remain open or be damaged when switches are tested as specified in 4.6.10. Open contacts may close for up to 10 milliseconds (ms) but shall not remain closed or be damaged when switches are tested as specified in 4.6.10. Not more than 100 lb/in² shall be required to operate the switches when tested as specified in 4.6.16. The pressure switches shall function satisfactorily when tested as specified in 4.6.20.

3.2.11 Discharge nozzles. Discharge nozzles shall be single lateral or 360-degree discharge patterns as specified (see 6.2.1). Single lateral nozzles shall have a 150-degree discharge pattern producing a 25-foot throw and shall be suitable for mounting against a bulkhead. The 360-degree pattern nozzles shall produce a uniform Halon air mixture at all points within a 15-foot radius, 8 feet below the nozzle. Material shall be type 316 CRES or type CF-8M if cast. The orifice size (code number) of the nozzles shall be that which produces the required flow rate (see 6.2.1). The orifice code number shall be in accordance with table III and shall be stamped on the nozzle body in two places approximately 135 degrees apart or on the outlet end. The nozzle inlet connection shall be 1-inch nps male NPT threads. A blowout cover or cap shall be furnished with each nozzle having orifice or discharge openings with a diameter or minimum dimension of 1/8 inch or less. Nozzles shall be of the orifice type. Baffle type nozzles shall not be provided.

TABLE III. Discharge nozzle orifice size¹.

Orifice code no.	Equivalent single orifice diameter-inches	Equivalent single orifice area-square inches
3	3/32	0.0069
3+	7/64	.0094
4	1/8	.0123
4+	9/64	.0155
5	5/32	.0192
5+	11/64	.0232
6	3/16	.0276
6+	13/64	.0324
7	7/32	.0376
7+	15/64	.0431
8	1/4	.0491
8+	17/64	.0554
9	9/32	.0621
9+	19/64	.0692
10	5/16	.0767
11	11/32	.0928
12	3/8	.1105
13	13/32	.1296
14	7/16	.1503
15	15/32	.1725
16	1/2	.1964
18	9/16	.2485
20	5/8	.3068
22	11/16	.3712
24	3/4	.4418
32	1	.785
48	1-1/2	1.765
64	2	3.14

¹ The orifice code number indicates the equivalent single orifice diameter in 1/32 inch increments. A plus sign following this number indicates equivalent diameters 1/64 inch greater than that indicated by the numbering system.

3.2.12 Cylinder clamps and saddles. Halon cylinders will be fastened to the ship structure by two clamping devices, each made up of a saddle and a clamp which shall be furnished by the equipment manufacturer. Installation instructions contained in the technical manual (see 6.6) shall contain minimum strength requirements for the members to which the saddles are to be attached. Nonmagnetic (other than aluminum) cylinder clamps and saddles shall be furnished when class II equipment is specified (see 6.2.1).

3.2.13 Scales. A mechanical bench type beam scale shall be furnished to weigh Halon cylinders (see 6.2.1). The scale shall weigh up to 310 pounds at full scale accuracy. The scale shall be provided with minimum graduations of 2 ounces or 0.1 pound and have an accuracy of plus or minus 1/2 pound. The scale shall be of steel construction with sliding weights permanently attached to the scale to provide quick and easy operation. The platforms shall be suspended to absorb loading shocks and provide maximum protection of hardened steel pivots and bearings. The poise rails shall be of stainless steel. The scale shall meet all requirements of NBS Handbook H44. Scales shall be factory calibrated. The scale shall be provided with a handle to transport it to multiple weighing sites. A positive locking device shall be provided to lock the platform when being transported. Maximum weight of the scale shall not exceed 55 pounds. The dimensions of the platform shall not exceed 17 by 22 inches. A scale accuracy test shall be conducted as specified in 4.6.12.

3.2.14 Cylinder charges. Unless otherwise specified herein, all Halon cylinder assemblies shall be charged with the required weight plus or minus 1 pound of Halon 1301, in accordance with MIL-M-12218 (see tables I and II). The charged Halon cylinder assemblies shall be super-pressurized with dry nitrogen in accordance with BB-N-411 to a total pressure of 600 to 675 lb/in² at 70°F (21°C) and verified as specified in 4.4.4 and 4.6.19. The order of charge of the agents is optional. The CO₂ actuating cylinders shall be charged with 80 ± 1 ounce of CO₂ in accordance with grade B of BB-C-101.

3.2.15 Forgings. Where a forging process is used to fabricate pressure containing parts, the forgings shall conform to the requirements specified in the applicable material specification (see 3.2.3).

3.2.16 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.3 Hydrostatic pressure. The check valves, cylinder valves, flexible discharge hoses, time delay bypass valves, flexible actuation hoses, time delay devices, and pressure switches shall withstand a hydrostatic pressure of 3250 lb/in² (1750 lb/in² for flexible discharge hoses) for 90 seconds with no signs of leakage, evidence of porosity, permanent distortion or structural failure when tested as specified in 4.6.1.

3.4 Actuation system valve seat tightness. Check valve and time delay bypass valve leakage shall not exceed 12 cubic centimeters per 90 seconds per inch nps when subjected to a hydrostatic pressure of 100 lb/in² at the outlet (see 4.6.2).

3.5 Cylinder and valve assembly leakage.

3.5.1 Halon cylinder and valve assembly. The Halon cylinder valve assembly shall be free of evidence of leaks when tested as specified in 4.6.7.

3.5.2 CO₂ actuating cylinder and valve assembly. The CO₂ actuating cylinder valve assembly shall show no signs of leakage of CO₂ gas from the cylinder or valve during or following submergence in water at a temperature of 32 to 43°C for a period of 1 hour (see 4.6.8).

3.6 High-impact (H.I.) shock. Items specified in 3.2, except flexible hoses and scales shall meet the grade A, class I, type A, medium weight shock requirements of MIL-S-901 when tested as specified in 4.6.10.

3.7 Vibration. Items requiring high impact shock test (see 3.6) shall also meet the vibration requirements of type I of MIL-STD-167-1 (see 4.6.11).

3.8 Magnetic permeability. Class II items, except scales, shall have a magnetic permeability not to exceed 2.0 after complete fabrication (see 4.6.13).

3.9 Safety disc. The safety discs shall withstand a pressure of 2000 lb/in² for 30 seconds at 21°C. The disc shall burst at a pressure of not less than 2650 lb/in² and not in excess of 3000 lb/in² (see 4.6.14).

3.10 Salt spray. All items, except scales, shall withstand a salt spray test of 480 hours with no signs of corrosion or change in condition which would adversely affect or tend to affect the operation of the equipment (see 4.6.15).

3.11 Halon cylinder valve opening and discharge. When the Halon cylinder and valve assembly is filled with water and subjected to the opening and discharge test (see 4.6.17) the Halon valve shall open at not more than 600 lb/in² and shall remain in the open position until a minimum of 90 percent of the water is discharged. After discharge, the valve shall close automatically.

3.12 Recharging. The cylinders shall be rechargeable without replacement of any valve part, except failed safety discs. Cutter disc or squib (detonator) actuated cylinder valves will not be acceptable.

3.13 Weight stamping. The actual empty (tare) weight of the cylinder and valve, the full weight (actual weight of the cylinder, valve, nominal Halon 1301 charge and nitrogen charge), and the nominal weight of the Halon 1301 charge shall be stamped on the cylinder dome with a round bottom stamp.

3.13.1 Halon liquid level. The level of the liquid Halon in the fully charged size 3, 4, and 5 cylinders at 70°F (21°C) shall be determined and shown on the cylinder by means of a label. The label shall be affixed to the cylinder directly below the pressure gauge. The label shall be a decal of the self-sticking type with an arrow and the words "Full Mark 70°F" printed thereon.

3.14 Painting.

3.14.1 CO and Halon cylinders shall be cleaned, treated and painted in accordance with type A of MIL-T-704, except as follows:

- (a) Blast cleaning shall be to near white metal in accordance with SSPC SP-10.
- (b) Treatment after cleaning shall be solely with an organic pretreatment primer.
- (c) Primer shall be in accordance with TT-P-1757.
- (d) Finish coat shall be in accordance with MIL-STD-101 and MIL-T-704, type A.

3.14.1.1 The cylinder color band requirements of MIL-STD-101 may also be met by the use of 2 mil vinyl strips with permanent adhesive backing, affixed over the finish coat of 3.14.1(d).

3.14.2 CO₂ and Halon cylinders shall be marked and color coded in accordance with MIL-STD-101. The title shall be painted on two diametrically opposite sides of the cylinders. The title of the CO₂ cylinders shall be as follows:

"HALON SYSTEM
ACTUATOR
CARBON DIOXIDE"

The title for the Halon cylinders shall be as follows:

"BROMOTRIFLUOROMETHANE
(HALON 1301) (FIRE ONLY)
(NON-SHAT)"

Letter sizes may be reduced from those specified in MIL-STD-101 so as to fit the cylinder size.

3.14.3 Painted surfaces on which the paint is damaged or defective shall be cleaned and repainted with the original specified paint of the same quality and color.

3.15 Special tools. No special tools other than scales and a liquid level instrument shall be required for normal maintenance of equipment covered by this specification. Special tools are defined as those tools not listed in the Federal Supply Catalog (copies of this catalog may be consulted in the office of the Defense Contract Administration Services Management Area (DCASMA)).

3.16 Drawings. When specified in the contract or order, drawings shall be prepared (see 6.2.2).

3.17 Marking. Halon cylinders, valves, pneumatic valve actuators, pneumatic actuation devices, flexible hoses, check valves, vent fittings, time delay devices, time delay filters, pressure switches, discharge nozzles, cylinder clamps and saddles, pneumatic actuation device and time delay device brackets, scales, and time delay bypass valves shall be marked in accordance with MIL-STD-130, except that attachment of a metal tag, stamped with the Federal Supply Code for Manufacturers (FSCM) number and the part number, is acceptable for marking pneumatic valve actuators, flexible hoses, vent fittings, vented caps for the pneumatic valve actuator inlet, and anti-recoil caps for the Halon cylinder valve outlet. The carton containing seal wires shall be marked in accordance with MIL-STD-130. Seal wires need not be marked.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- (a) Qualification inspection (see 4.3).
- (b) First article inspection (see 4.3.2).
- (c) Quality conformance inspection (see 4.5).

4.3 Qualification inspection. Qualification inspection shall be conducted at a laboratory satisfactory to NAVSEA. Qualification inspection shall consist of the tests shown in table IV. Failure of any test shall constitute failure to qualify.

TABLE IV. Qualification, first article and quality conformance inspection.

Test	Requirement	Test	Class I	Class II	Quality conformance
			Quali- fication	First article	
Halon cylinder pressurization	3.2.14	4.6.19	X	X	X
Visual and dimensional examination	---	4.5.1	X	X	X
Hydrostatic	3.3	4.6.1	X	X	X ³
Actuation system valve seat tightness	3.4	4.6.2	X	X	X
Time delay calibration and leakage	3.2.9	4.6.3, 4.6.8.1	X	X	¹
Discharge hose flow	3.2.5	4.6.4	X	X	
Valve flow	3.2.7, 3.2.3.6	4.6.5	X	X	
CO ₂ actuating cylinder valve lock open device	3.2.4.2	4.6.6	X	X	
Halon cylinder valve assembly leakage	3.5.1	4.6.7	X	X	¹
Halon cylinder valve torque	3.2.3	4.6.7.1	X	X	X
Halon cylinder valve breaking torque	3.2.3	4.6.7.2	X	X	
CO ₂ actuating cylinder valve assembly leakage	3.5.2	4.6.8	X	X	¹
Forgings	3.2.15	4.6.9	X	X	
High impact shock	3.6	4.6.10	²	²	
Vibration	3.7	4.6.11	²	²	
Scale accuracy	3.2.13	4.6.12	X	X	X
Magnetic permeability	3.8	4.6.13	X	X	X
Safety release device bursting	3.9	4.6.14	X	X	X
Salt spray	3.10	4.6.15	X	X	
System actuation	3.2.3.2, 3.2.3.4	4.6.16	²	²	
Halon cylinder valve opening and discharge	3.11	4.6.17	²	²	
Enclosure (pressure switch)	3.2.10	4.6.18	X	X	
Pressure switch cycle	3.2.10	4.6.20	²	²	

¹ These tests shall be conducted on 100 percent of production.

² These tests shall be conducted on only one sample.

³ These tests shall be conducted on 100 percent flexible hoses.

4.3.1 Samples for qualification and first article. Unless otherwise specified herein, two samples of each of the items specified shall be subjected to the qualification inspection of 4.3, and the first article inspection of 4.3.2.

4.3.1.1 Extension of qualification approval for class I only. If a manufacturer desires qualification approval for all sizes of class I cylinders, class I, size 5 cylinders shall be subjected to the qualification inspection (see 4.3). If the class I, size 5 cylinders conform to this specification, qualification approval will be extended to cover class I, sizes 1 through 4 cylinders.

4.3.2 First article inspection for class II only. First article inspection shall consist of the examination and tests specified in table IV, conducted in the order shown, or as acceptable to NAVSEA.

4.3.2.1 If a contractor desires first article approval for all sizes of class II cylinders, class II, size 4 cylinders shall be subjected to the first article inspection of 4.3.2. If the class II, size 4 cylinders conform to this specification, first article approval will be extended to cover class II, sizes 1 through 3 cylinders.

4.4 Sampling for quality conformance inspection.

4.4.1 Inspection lot. For purposes of sampling, a lot shall consist of all individual components of the same class and size which are manufactured under essentially the same conditions and final inspected at one time.

4.4.2 Sampling for visual and dimensional examination. A random sample shall be selected from each lot in accordance with inspection level S-4 of MIL-STD-105 for the visual and dimensional examination of 4.5.1. The acceptable quality level (AQL) shall be 2.5 percent defective for major defects and 6.5 percent defective for minor defects.

4.4.3 Sampling for quality conformance tests. A random sample shall be selected from each lot in accordance with inspection level S-4 of MIL-STD-105 for the tests specified in 4.5.2. The AQL shall be 0.65 percent defective.

4.4.4 Sampling for Halon cylinder pressurization. After a minimum of 24 hours, a random sample shall be selected from each lot in accordance with inspection level S-1 of MIL-STD-105 for the tests specified in 4.6.19. The AQL shall be 4 percent defective. The actual fill pressure, temperature corrected to 70°F (21°C) shall be verified with a gauge of at least 1 percent accuracy marked in 5 lb/in² or smaller increments.

4.4.5 Sampling of forgings. Where forging process is used to fabricate pressure containing parts, one sample shall be selected at random from each 500 forgings, or a fraction thereof, of any one heat for tests to determine conformance with the applicable specification specified herein. Samples or sample drillings shall be obtained from each individual sample part for chemical analysis to ensure that the material conforms to the applicable specification specified herein. Samples shall be extracted in accordance with method 111.2 of FED-STD-151 and tested in accordance with 4.6.9.

4.5 Quality conformance inspection.

4.5.1 Visual and dimensional examination. Each sample item selected in accordance with 4.4.2 shall be visually and dimensionally examined to determine conformance with this specification. Major and minor defects shall be classified as shown in table V. Any sample failing to conform to the visual and dimensional examination shall be rejected and if the rejection number exceeds the acceptance number for that sample, the lot represented by the sample shall be rejected.

TABLE V. Classification of defects.

<u>Critical</u>	None defined
<u>Major</u>	
101	Size not as specified.
102	Missing or incorrect parts.
103	Parts loose or damaged so as to interfere with proper operation.
104	Threads not as specified.
105	Time delay period not stamped as specified.
106	Component identification not as specified.
107	Dimensions incorrect affecting proper operation.
108	Weights not as specified.
<u>Minor</u>	
201	Parts loose or damaged but not interfering with operation.
202	Dimensions incorrect but not interfering with operation.
203	Identification markings missing, incorrect or illegible.
204	Paint coverage incomplete; evidence of cracking, peeling or blistering of paint.

4.5.2 Quality conformance tests. The sample items selected in accordance with 4.4.3 shall be subjected to the quality conformance tests shown in table IV. Any sample which fails any quality conformance test shall be rejected and if the rejection number of defectives exceeds the acceptance number of defectives, the lot represented by the sample shall be rejected.

4.6 Test procedures.

4.6.1 Hydrostatic test. To determine conformance with 3.3, check valves, cylinder valves, flexible actuation hoses, time delay devices and pressure switches shall be hydrostatically tested for strength with water at ambient temperature at 3250 lb/in² for 90 seconds. Flexible discharge hoses shall be tested as above, except that the pressure applied shall be 1750 lb/in². There shall be no leakage or evidence of porosity, permanent distortion, or structural failure.

4.6.2 Actuation system valve seat tightness tests. Check valves and time delay bypass valves shall be tested for at least 90 seconds with 100 lb/in² applied at the outlets. Selector valves shall be tested with the element in both positions. The inlet shall be open. Valve leakage shall not exceed 7 cubic centimeters per 90 seconds per inch nps. Tests shall be performed with water at ambient temperature.

4.6.3 Time delay calibration. To determine conformance with 3.2.9, the actual delay period shall be determined by testing each time delay device. The tests shall be conducted with CO₂ at 850 ± 25 lb/in², and with the time delay device at a temperature between 70 and 80°F (21 to 27°C), inclusive. The CO₂ shall be delivered to the delay device in liquid form if the pneumatic actuation device (see 3.2.4) has a siphon tube, or in gaseous form if the pneumatic actuation device does not have a siphon tube. The actual time required for the time delay device to operate shall not be determined manually, and shall not vary from the nominal setting by more than plus or minus 5 seconds. If the actual period is determined to be 55, 56, 64, or 65 seconds for a nominal 60-second device, the device shall be re-tested after the temperature of the device has returned to between 70 and 80°F (21 to 27°C). The actual delay period shall not vary from the nominal setting by more than plus or minus 5 seconds when determined by the second test. If the time delay device main valve is not positively closed by mechanical means (such as a spring) following an operating cycle, the time delay device used in tests shall be initiated with the main valve in full open position.

4.6.4 Discharge hose flow. Equivalent length of discharge hoses (bent to 90 degrees on approximate 22-inch radius) shall be determined by flow tests with water while the Reynolds number is maintained at greater than 10⁵ during the tests. The equivalent length of discharge hose shall not exceed 20 feet of 1-1/2 inch schedule 80 steel pipe.

4.6.5 Valve flow tests. Equivalent length of discharge check valves and Halon cylinder valves with siphon tube attached shall be determined by flow tests with water while the Reynold's number is maintained at greater than 10⁵ during the tests. The equivalent length of the cylinder valve and siphon tube assembly shall not exceed that specified in 3.2.3.6. The equivalent length of check valves shall not exceed that specified in 3.2.7.1.

4.6.6 CO₂ actuating cylinder valve lock-open device test. Actuating cylinder valves shall be cycled at least 1000 times to determine proper function of the locking device (see 3.2.4.2).

4.6.7 Halon cylinder and valve assembly leakage. Each fully charged Halon cylinder shall be tested with an electronic halide lead detector with the detector leak index sensitivity set at 1/2 ounce per year to determine conformance with 3.5.1.

4.6.7.1 Halon cylinder and valve torque test. With the Halon cylinder restrained, a counterclockwise torque of 150 foot-pounds shall be applied to the valve. There shall be no evidence of movement of the valve in reference to the cylinder. In order to determine whether movement occurs, the cylinder valve shall be match marked to the cylinder prior to the test.

4.6.7.2 Halon cylinder and valve breaking torque test. With the Halon cylinder retrained, counter clockwise torque shall be applied to the valve until valve movement occurs. The torque which results in valve movement shall be not greater than 300 foot-pounds. To determine whether movement occurs, the cylinder valve shall be match marked to the cylinder prior to the test.

4.6.8 CO₂ actuating cylinder and valve assembly leakage. Each fully charged CO₂ actuator shall be submerged in deaerated water at a temperature of not less than 32°C nor more than 43°C for a period of 1 hour. During the test, each actuator shall be inspected for leaks. Any signs of escape of CO₂ gas from the cylinder or valve shall be cause for rejection. Following completion of testing, all traces of moisture shall be removed from the operating portion of the valve and the safety-release mechanism (see 3.5.2).

4.6.8.1 Time delay device leakage. Each fully assembled time delay device shall be tested for leakage simultaneously with the time delay calibration test. Leakage shall be determined by visual soap test. Any sign of leakage shall be cause for failure.

4.6.9 Chemical analysis of forging. Samples of forgings shall be chemically analyzed in accordance with method 111.2 of FED-STD-151.

4.6.10 Shock test. The following items shall be subjected to the grade A, class I, type A, medium weight shock test of MIL-S-901:

- (a) An assembly of one class I, size 5 (125-pound) or class II, size 4 (95-pound) cylinder with valve and siphon tube restrained by the clamps specified in 3.2.12 filled with 125 pounds or 95 pounds as applicable, of Halon 1301 and pressurized to 600 lb/in² at 70°F with nitrogen. As an alternative (for safety considerations) the cylinder may be filled with 125 pounds (class I, size 5) or 95 pounds (class II, size 4) of a noncorrosive liquid having a specific gravity in the range of 1.25 to 1.60 (such as glycerin or an aqueous solution of potassium carbonate) and pressurized to 600 lb/in² at 70°F with nitrogen.
- (b) One unpressurized, discharge check valve mounted on the side outlet of a tee between two lengths of pipe which are secured to the shock table by two pipe supports in accordance with Drawing 810-1385782.
- (c) One unpressurized time delay device with installed filter secured to the shock table, with the mounting bracket specified in 3.2.9.
- (d) One unpressurized pressure switch.
- (e) One complete pneumatic actuation device of each type at operating pressure secured to the shock table with the mounting bracket specified in 3.2.4.3. As an alternative (for safety considerations) the cylinder may be filled with 5 pounds of a noncorrosive liquid having a specific gravity in the range of 1.25 to 1.60 (such as glycerin or an aqueous solution of potassium carbonate) and pressurized to 850 lb/in² at 70°F with nitrogen.
- (f) One unpressurized discharge nozzle of each pattern, with orifice number 24, secured by a rigidly mounted pipe coupling.

- (g) One unpressurized time delay bypass valve mounted between two lengths of pipe which are secured to the shock table by two pipe supports in accordance with Drawing 810-1385782.
- (h) One unpressurized actuation manifold check valve mounted identical to the time delay bypass valve.

4.6.10.1 Failure criteria. Post shock examination shall reveal no change in condition which will adversely affect or tend to affect the operation of the component or system. Minor distortion of mounting brackets, clamps, and fixtures incurred during shock and vibration testing (see 4.6.11) is acceptable. However, visible cracks or breakage of mounting clamps, brackets, or fixtures shall be cause for rejection.

4.6.10.2 Pressure switch and electric solenoid operated pneumatic actuation device. Pressure switches shall be tested with the switch in both positions. Contacts shall be monitored during the shock test. A contact is considered monitored when, during the shock test, the contact is part of an energized circuit where malfunction of the contact would cause the monitor circuit to indicate occurrence of the malfunction. Closed contacts shall be monitored by a means that will determine if a contact momentarily opens. Open contacts shall be monitored by a means that will determine if a contact momentarily closes. Contact monitoring may be done by calibrated relay (for closed contacts only) oscilloscope, oscillograph, or other appropriate means that is consistently repeatable with plus or minus 10 percent accuracy. Any change of state that would require restarting of equipment if the equipment was operating, or that would cause application of power if the equipment was not in operation, shall constitute failure.

4.6.10.3 Cylinders (CO₂ actuating and Halon). When subjected to the shock test, cylinders shall not rise in the brackets more than 2 inches cumulative for all blows.

4.6.10.4 Combination manual and electric operated actuation devices. Combination manual and electric operated actuation devices shall be shock tested with the solenoid energized in both positions. Any change of state that would result in actuation of the Halon system if the actuation device was initially in the ready position, or that would result in shut off of CO₂ flow that would require manual operation of the device if it was in the operated position, shall constitute failure.

4.6.11 Vibration test. All items shock tested as specified in 4.6.10 shall also be subjected to the type I vibration tests of MIL-STD-167-1.

4.6.11.1 Pressure switches and electric solenoid operated pneumatic actuation device. Pressure switches and electric solenoid operated pneumatic actuation device shall withstand the vibration tests without mechanical damage, contact chatter, or other electrical malfunctioning.

4.6.12 Scale accuracy tests. Halon cylinder scales shall be tested with known weights of 100, 200 and 300 pounds and shall be accurate to within plus or minus 1/2 pound. CO₂ actuator cylinder scales shall be tested with a known weight of 20 pounds and shall be accurate to within plus or minus 1/4 pound.

4.6.13 Magnetic permeability tests. For class II equipment, one of each item, except scales (see 3.15), shall be selected and tested for magnetic properties. Class II cylinders and cylinder valves with siphon tubes shall be tested as an assembly. The magnetic permeability of each item or assembly shall be determined by means of a permeability indicator of the go-no go type conforming to or equal to that specified in MIL-I-17214. The magnetic permeability shall conform to 3.8.

4.6.14 Safety release device bursting test. The sample discs selected for tests shall be secured in an adapter having a pressure opening of a size identical to that of the valves and held in place by the washers and safety nuts taken from valves or others having identical dimensions. Tests shall be conducted at room temperature (approximately 70°F (21°C)). A high pressure hydrostatic test line shall be applied to the adapter for the purposes of this test. The test pressure may be raised rapidly to 2,000 lb/in², held there for at least 30 seconds, and thereafter shall be raised at a rate not in excess of 100 lb/in² per minute, until the disc bursts. The actual bursting pressure shall not be in excess of 3,000 lb/in² nor less than 2650 lb/in² (see 3.9).

4.6.15 Salt spray test. All items, except scales, shall be tested in accordance with method 509.2 of MIL-STD-810. Duration of the salt spray test shall be 480 hours. Subsequent examination shall reveal no change in condition which will adversely affect or tend to affect the normal operation of the item or system (see 3.10).

4.6.16 System actuation test. To verify component function, a system consisting of the items specified herein (except the pressure gauge in the actuating manifold) shall be erected and tested as follows:

- (a) A CO₂ cylinder with quick-opening valve as specified in 3.2.4 (except that the CO₂ charge shall be 72 ounces) shall be connected by 150 feet of 1/4-inch schedule 80 nps pipe to the actuators of 22 Halon cylinders (class I, size 5 or class II, size 4, as applicable) and valves with anti-recoil caps installed as specified in 3.2.3.1.
- (b) An actuating manifold check valve as specified in 3.2.7 shall be installed approximately 2 feet downstream of the actuating cylinder.
- (c) Approximately 1 foot downstream of the check valve, a second actuating check valve shall be installed in the lateral of a pipe tee with the inlet of the valve open.
- (d) A nominal 60-second time delay device (with inlet and outlet hoses) as specified in 3.2.9 shall be installed at the approximate midpoint of the run of pipe.
- (e) A pressure gauge and pressure switch (with inlet hose) as specified in 3.2.10 shall be installed downstream of the time delay device and shall be connected to a power source and indicating lamp so that proper function of the switch and time delay may be observed and recorded. For this test, the cylinders shall be half full of water and pressurized to 3000 lb/in² with nitrogen and the safety discs shall be replaced with discs which will rupture at approximately 3300 lb/in². The pressure gauge shall be removed and outlet plugged. The

CO₂ cylinder shall be conditioned for 1 hour in a controlled temperature chamber at 50°F (10°C). Upon release of CO₂ by the quick-opening valve and time delay device, the Halon cylinder valve shall open and discharge at least 90 percent of the water from all cylinders simultaneously and without hazardous cylinder movement. During the tests, the vent fittings as specified in 3.2.8 shall be installed in the dead end of the CO₂ actuating manifold. Except for those items which have been damaged or destroyed in the forging test of 4.6.9 or the safety release device bursting test of 4.6.14, items used in previous tests shall be included in the system actuation test.

4.6.16.1 Verifying proper recycle and function. To verify proper recycle and function, where the time delay device valve design is such that a positive, mechanical means (such as a spring) of main valve closure is not used (whereby the time delay device main valve is positively closed following an operating cycle), the time delay device used in the system actuation test shall be initiated with the main valve in the full open position. The pressure switch downstream of the time delay shall not actuate until the time delay has completed its cycle. The actual delay period shall not vary from the nominal setting by more than plus or minus 5 seconds.

4.6.17 Halon valve opening and discharge. One Halon valve, actuator and cylinder assembly shall be tested as follows: A source of CO₂ or nitrogen, a pressure regulator, and a stop valve and pressure gauge installed in the lateral of a pipe tee shall be installed in series with a class I, size 5 or class II, size 4 Halon valve actuator and cylinder assembly filled with water, as specified in 4.6.16. The CO₂ or nitrogen actuation pressure shall be raised from 0 lb/in² at a rate not to exceed 50 lb/in² per second. The actuation pressure at the instant of the Halon cylinder valve opening shall not exceed 600 lb/in². At the instant of the Halon valve opening, the CO₂ or nitrogen flow shall be halted and the stop valve opened rapidly to bleed the actuation pressure to 0 lb/in² whereupon the Halon valve shall sustain itself in an open position until at least 90 percent of the water is discharged. After discharge the valve shall close automatically.

4.6.18 Enclosure (pressure switch). The pressure switch shall be subjected to the watertight enclosure test of MIL-E-2036.

4.6.19 Halon cylinder pressurization. The actual fill pressure, temperature corrected to 70°F (21°C), shall be verified with a gauge of at least 1 percent accuracy, marked in 5 lb/in² or smaller increments. If valve unseating or reseating pressure is required, dry nitrogen in accordance with BB-N-411 shall be used.

4.6.20 Pressure switch cycle test. The pressure switch shall be test operated by nitrogen at a pressure of 2225 ± 50 lb/in² at least 100 times, and shall be manually closed each time. During the tests, the pressure switch shall be connected to a power source and indicating lamp. The indicating lamp shall operate each time the pressure switch is operated by the nitrogen. Failure of the lamp to operate shall be cause for failure of this test.

4.7 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

4.7.1 When specified (see 6.2.1), and when level A preservation-packaging and level A or B packing are required, prior to beginning package production, a pack of the systems shipping container shall be subjected to the rough handling tests of MIL-P-116.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements of referenced documents listed in section 2, see 6.7.)

5.1 Preservation. Preservation shall be level A or commercial as specified (see 6.2.1).

5.1.1 Level A. Systems equipment shall be cleaned and dried by a process and procedure in accordance with MIL-P-116 that will ensure removal of corrosion, dirt, grease, and all forms of foreign material. Metal surfaces subject to corrosion shall be coated with preservative, in accordance with P-2 or P-19 of MIL-P-116. P-2 preservative shall be used where its removal is required prior to placing the equipment part in use. Greaseproof wraps, when required, shall be applied in accordance with MIL-P-116. Petroleum base solvents, preservations and lubricants shall not be applied to any part of the gas cylinders, valves, or other pressure-containing assemblies. Openings, pipe terminations, hose ends, inlet and outlet connections, valve flanges, and similar items shall be sealed with covers, plugs, or with a noncorrosive, greaseproof, waterproof barrier material and secured in a manner to prevent entrance of any foreign material. Nonelectrical preserved parts shall meet the requirements of method I and unpreserved parts method III of MIL-P-116. Electrical parts of each system shall be preserved in accordance with the methods and criteria of MIL-E-17555. Each individual part shall be separately packed (unit protected) in a unit container or cushioned, anchored, blocked, and braced within the system shipping container.

5.1.1.1 Cushioning and wrapping materials. The use of excelsior, newspaper, shredded paper (all types, including wax paper) and similar hydroscopic or nonneutral materials and all types of loose-fill materials, for applications such as cushioning, fill, stuffing and dunnage is prohibited. Materials selected for cushioning and wrapping shall have properties (characteristics) resistant to fire. MIL-E-17555 provides guidance for fire retardant materials.

5.1.2 Commercial. Preservation of parts and equipment shall be in accordance with ASTM D 3951.

5.2 Packing. Packing shall be level A, B, C or commercial as specified (see 6.2.1).

5.2.1 General requirements.

5.2.1.1 Levels A, B and C. Each extinguisher system of the same class and size preserved as specified in 5.1 shall be packed in a shipping container of minimum weight and cube consistent with the protection required. Shipping containers with a gross weight of 200 pounds or over and those with length and width dimensions of 48 by 24 inches or more weighing more than 100 pounds shall be provided with skids of minimum size nominal 3 by 4 inch lumber laid flat and attached in such a manner as to permit the use of lifting devices and material handling equipment. The skids may be attached crosswise or longitudinally as best suited for the use of material handling equipment, except that where boxes and crates conform to Federal or Military specifications, the skids shall be as specified therein. In addition to specification requirements, 4-way entry shall be provided to material handling equipment on containers 60 inches or more in length or width. Further provisions shall be made to ensure that load-bearing members are provided in areas subject to contact with lifting devices. Crates shall be used for the shipment of individual systems exceeding the weight limitations specified for the wooden container specification. Open crates may be used in conjunction with wood boxes as a shipping media for systems with several gas cylinders wherein the balance of the system parts could be readily placed in a smaller wood container to be secured within the open crate. Systems shipped in open crates shall be shrouded with flexible waterproof barrier material as specified in MIL-STD-1186 or polyethylene minimum 0.006 inch thick. When used, triple-wall corrugated containers exceeding 250 pounds gross weight shall be modified with reinforcing strength members and shall have wooden skids.

5.2.1.2 Clearance. A clearance of not less than 1 inch shall be allowed between the item and the closest member of the sides, ends, and top of the container. Fragile items or items within floating bag barriers shall be protected with clearances of 2 to 4 inches. Protruding parts at the top may be allowed to extend between joists and spacing of joists may be adjusted slightly to accommodate projections.

5.2.1.3 Anchoring, blocking, bracing, and waterproofing. Anchoring, blocking, bracing, and waterproofing of container contents shall be in accordance with MIL-STD-1186 and the applicable container specification and appendix thereto.

5.2.1.4 Fire retardant treatment. Unless otherwise specified (see 6.2.1), wood and plywood shipping containers destined for shipboard stowage shall be fire-retardant treated in accordance with MIL-L-19140, type II treatment.

5.2.2 Shipping containers.

5.2.2.1 Levels A, B and C. Packing, exterior (shipping and storage) containers shall conform to the exterior container selection tables listed in MIL-STD-794, with container selection at the option of the contractor.

5.2.2.1.1 Crate tops. Alternatively, in lieu of the outer lumber sheathing for crate tops, 3/8-inch plywood may be used. Plywood shall be of the exterior grade specified in the crate specification.

5.2.2.2 Closure and reinforcement. Exterior containers shall be closed, reinforced or banded in accordance with the applicable container specification or appendix thereto, except that PPP-B-636 fiberboard boxes shall be closed method V for weather-resistant grade boxes and reinforced with non-metallic banding or pressure sensitive filament tape in lieu of metal straps or wire banding. Closure for PPP-B-636 domestic grade boxes shall conform to method I.

5.2.3 Commercial. Each extinguisher system of the same class and size, preserved as specified in 5.1 shall be packed in accordance with ASTM D 3951.

5.3 Marking. In addition to any special marking required (see 6.2.1), or herein, level A, B and C interior packs and exterior shipping containers shall be marked in accordance with MIL-STD-129. Commercial packs and shipping containers shall be marked in accordance with ASTM D 3951.

5.3.1 Special marking.

5.3.1.1 Hazardous materials. Gas cylinders and, where applicable, shipping containers with gas cylinders packed within, shall be marked as required by the DOT, title 49.

5.3.1.2 Warranty marking. Warranty markings shall be applied in accordance with the figures for interior and exterior warranty marking, as applicable, of MIL-STD-129.

5.4 Technical manuals. Technical manuals, which accompany shipments, shall be packed in minimum 4 mil transparent plastic bags. Bag closure shall be by heating sealing. Technical manuals shall not be placed within any flexible sealed barrier enclosing components. The copies of the manual shall be placed in the shipping container housing the main unit. Packing lists shall indicate which container contains the technical manuals and shall also state the approximate location therein. For ease of removability, the location of the manuals shall be such that they are readily accessible when the container is opened. Technical manuals, when shipped in bulk quantities, shall not be individually wrapped, but shall be packed in accordance with the requirements of the applicable technical manual specification or packed in containers conforming to the requirements for level A, B, or C, as specified (see 6.2.1).

5.5 Charged gas cylinders. When specified (see 6.2.1), the required number of gas cylinders shall be packaged in accordance with RR-C-901 in lieu of packing the cylinders with the system parts as specified in 5.1.

6. NOTES

6.1 Intended use. The equipment covered by this specification is intended for use in on board chemical (Halon 1301 liquified and pressurized with nitrogen to 600 lb/in² at 70°F (21°C)) fire extinguisher systems of the fixed (stationary) type. The basic system arrangements are shown on Drawing 803-5773930 and Drawing 803-5959326.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Class of system required (see 1.2 and 3.2.12).
- (c) Quantity and size of Halon cylinders required (see 1.2.1).
- (d) When first article inspection is required (see 3.1.1).
- (e) Quantity of pneumatic valve actuators required in addition to those assembled to Halon cylinder valves (see 3.2.3.2).
- (f) Quantity of pressure gauges required in addition to those assembled to Halon cylinder valves (see 3.2.3.5).
- (g) Quantity of only manually-operated actuation cylinders (see 3.2.4).
- (h) Quantity of combination manually and electrically operated actuation cylinders (see 3.2.4.2).
- (i) Quantity of actuation cylinder brackets (see 3.2.4.3).
- (j) Quantity of flexible discharge hoses (see 3.2.5).
- (k) Quantity of flexible actuation hoses (see 3.2.6).
- (l) Quantity of discharge check valves (see 3.2.7).
- (m) Quantity of actuation check valves (see 3.2.7.2).
- (n) If tail pieces of end connections of actuation check valves are required to be constructed of carbon steel (see 3.2.7.2).
- (o) Quantity of vent fittings (see 3.2.8).
- (p) Quantity of time delay devices with installed filter (see 3.2.9).
- (q) Quantity of time delay device brackets (see 3.2.9).
- (r) Quantity of time delay bypass valves (see 3.2.9.1).
- (s) If tail pieces of end connections of time delay bypass valves are required to be constructed of carbon steel (see 3.2.9.1).
- (t) Quantity of time delay filters required (see 3.2.9.2) in addition to those assembled.
- (u) Time delay devices.
- (v) Quantity of pressure switches (see 3.2.10).
- (w) Quantity, discharge pattern, and orifice code of discharge nozzles (see 3.2.11).
- (x) Quantity of Halon cylinder clamps and saddles (see 3.2.12).
- (y) Quantity of scales (see 3.2.13).
- (z) When rough handling test is required (see 4.7.1).
- (aa) Level of preservation and packing required (see 5.1, 5.2 and 5.4).
- (bb) When fire retardant treatment is not required (see 5.2.1.4).
- (cc) Special marking required (see 5.3).
- (dd) When gas cylinders are to be packed in accordance with RR-C-901 (see 5.5).

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the

DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraph.

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
3.16	Drawings, engineering and associated lists	DI-E-7031	Level 2

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5010.12-L., ANSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in Qualified Products List QPL-24572 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Sea Systems Command, SEA 55Z3; Department of the Navy, Washington, DC 20362-5101 and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification SD-6" (see 6.3.1).

6.3.1 Copies of "Provisions Governing Qualification SD-6" may be obtained upon application to Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

6.4 First article. When a first article inspection is required, the items should be a first article sample. The first article should consist of two units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.5 Provisioning. Provisioning Technical Documentation (PTD), spare parts, and repair parts should be furnished as specified in the contract.

6.5.1 When ordering spare parts or repair parts for the equipment covered by this specification, the contract should state that such spare parts and repair parts should meet the same requirements and quality assurance provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified in the contract.

6.5.2 Repair parts. On board repair parts should be furnished as specified for each end user and should consist of the following:

- | | |
|---|--|
| (a) Seal wires | 10 per CO ₂ actuating cylinder |
| (b) Flexible actuation hose | 10 percent or a minimum of three, whichever is greater |
| (c) Flexible discharge hose | 5 percent or a minimum of three, whichever is greater |
| (d) Halon cylinder valve actuator (if detachable) | 5 percent or a minimum of four, whichever is greater |
| (e) CO ₂ actuating cylinder and valve assembly (charged), manual | Equal in quantity to 1/6 times the number of time delay devices ordered (rounded up to the nearest whole number), plus one |
| (f) Fully charged replacement Halon cylinders and valve assemblies | 5 percent or a minimum of one, whichever is greater, for each class and size of cylinder ordered |
| (g) Pressure switch (electrical assembly) | One per ship (minimum) |
| (h) Time delay device | One per ship (minimum) of each nominal delay period ordered |
| (i) Discharge nozzle | 5 percent or a minimum of one (whichever is greater) for each orifice size and pattern required |
| (j) Cap, anti-recoil (valve actuator) | 5 percent or a minimum of four, whichever is greater |
| (k) Cap, anti-recoil (Halon cylinder valve outlet) | 5 percent or a minimum of four, whichever is greater |

6.6 Technical manuals. The requirement for technical manuals should be considered when this specification is cited on a contract. If technical manuals are required, a contract exhibit must be prepared to fully describe statement of work criteria and delivery instructions, and cite the applicable technical manual specification. The technical manuals must be acquired by separate Contract Line Item Number (CLIN) in the contract. Illustrations of all components and systems as installed should be included in the technical manuals. Sectional assemblies of all components, complete with manufacturer's part numbers, material and material specifications sufficient to provide clear illustration of the function of all parts should be included in technical manuals. Specific step-by-step recharging instructions for use by the Navy Supply System should be provided in the technical manual. Installation instructions for fastening the cylinder to the ship structure should also be included and should contain the minimum strength requirements for the members to which the saddles are to be attached (see 3.2.12). Technical manuals should be furnished as required.

6.7 Sub-contracted material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.8 Subject term (key word) listing.

Bromotrifluoromethane (Halon 1301), systems
Extinguisher, fire, fixed pipe
Fire extinguisher, pneumatically actuated

6.9 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER MIL-E-24572A(SH)		2. DOCUMENT TITLE EXTINGUISHER, FIRE, BROMOTRIFLUOROMETHANE (HALON 1301) SYSTEMS (FIXED PIPE, PNEUMATICALLY ACTUATED, NAVAL SHIPBOARD)	
3a. NAME OF SUBMITTING ORGANIZATION USE)		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify): _____	
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)

DD FORM 1426
82 MAR

PREVIOUS EDITION IS OBSOLETE.